

Flight Scientist Report  
Wednesday 5/19/2021 ACTIVATE RF68

Flight Type: Statistical Survey Flight  
Flight Route: KLF1 ECG OXANA A B C OXANA ECG KLF1  
Special Notes: CALIPSO underflight

**King Air**

Pilot report (Wusk):  
Take-off 1739 Z

Landing 2105Z

3.4 hours

Second flight of the day, 2-ship cooperative flight with the HU-25; routing KLF1 ECG OXANA 3401N07354W 3200N07321W 3401N07354W OXANA ECG KLF1, FL280. The lat/longs constituting a CALIPSO track. CALIPSO overpass at 1854. Due to heavy Air Force take-off push, the UC was delayed about 10 minutes on takeoff. During enroute climb out we were able to negotiate a shortcut passed ECG to make up some time. Nearing OXANA we were able to negotiate an early turn onto the CALIPSO track and cut out the dog leg at OXANA. Winds at altitude were still light but with the HU making an early turn in holding we were able to close to within three nm of the HU at overpass time. Both aircraft were about 30 miles north of the planned overpass point but coincidence was considered priority. On the Northbound return leg, also coordinated a straight continuation of the CALIPSO leg to intercept AR8. Once again attempted to coordinate an off-coast return through W-72, but was denied due to heavy exclusive Navy use. Commenced descent out of FL280 and passed over ECG at FL240 on return to field, Clear visibility at altitude. Crew was Jamison, Wusk, Harper and Seaman. Aircraft performed nominally with no issues and expected ready for next flight.

Flight scientist report (Harper):

UC12 Took off ~10 min after HU25. Modified initial outbound leg to get more direct route to coordinate with HU25 for satellite overpass run. Low tail winds at altitude increased difficulty to catch up to HU25.

Within 3miles of HU25 at overpass at 18:52utc.

Maintained less than 5min separation from HU25 throughout rest of flight until reaching the coast.

Weak aerosol layer(low depol, possibly smoke) existed at 20kft and above throughout flight.

MBL scattering ratio increased as we flew south.

No cirrus observed.

Sonde1: launched just after turn for satellite run. 18:37:23utc

Sonde2: CALIPSO overpass 18:52utc

Sonde 3: 19:13:31utc. Dropped just before southern most turn point.

Sonde 4: 20:25:00utc. At 12mi coastal boundary.

No instrument issues for HSRL2, RSP, or AVAPS.

### **Falcon**

Pilot report (Delaney):

Takeoff: 1330 / Land: 1700 EDT

Science flight for the HU-25 in support of ACTIVATE Campaign #4, conducted cooperatively with the UC-12 (2<sup>nd</sup> flight of the day). Departed Rwy08 with direct vectors down the coastline to KMQI, climbing to 5k ft MSL for initial transit. Winds were light and variable for majority of the flight. Research profiles conducted to KMQI through 3437N/07404W-3401N/07354W-3300N/07337W-3200N/07321W-3437N/07404W-KMQI-KLFI. Clear air modules executed throughout flight from 500 – 5500 ft MSL, with some quick in-cloud data collection at the turn-around point leveraging an isolated cloud formation at ~3500 ft MSL. Aircraft geolocation was initially separated by ~45 nmi due to UC-12 takeoff delays based on airfield traffic saturation. Compensated by flying HU-25 slower than nominal airspeeds and working a 360 degree turn at 3437N/07404W before proceeding down track for CALIPSO overpass. Geolocation was within 3 nmi for overpass (~30 nmi prior to 3300N/07337W at 1852UTC) and remained with ~10 nmi for remainder of flight. Upon reaching shoreline at KMQI, proceeded directly to KLFI due to fuel limitations collecting data between 3000-5000 ft MSL. All objectives were achieved and with no discrepancies noted.

Pilots: Delaney/Elder

QNCs: Crosbie/Winstead

Flight scientist report (Crosbie): CALIPSO coordinated flight. Conditions were very similar to the morning flight. Again a small patch of clouds were encountered near the far turn point that resulted in a slightly early turn to spend some time sampling. (5 clear with bonus 2x ACB)

Notes from Eddie:

17:33:40 - Sample filter on.

18:22 – Oscillations in UFCPC due to heat. Cabinet temperature over 45 C. Heat causing CPC aerosol sample flow to oscillate.

18:52:25 CALIPSO satellite underpass

19:12:45 – Sample filter A off for cloud penetration

19:19:30 – Sample filter A back on

20:08:45 - Sample filter A off for clouds

20:12:20 - Sample filter A back on

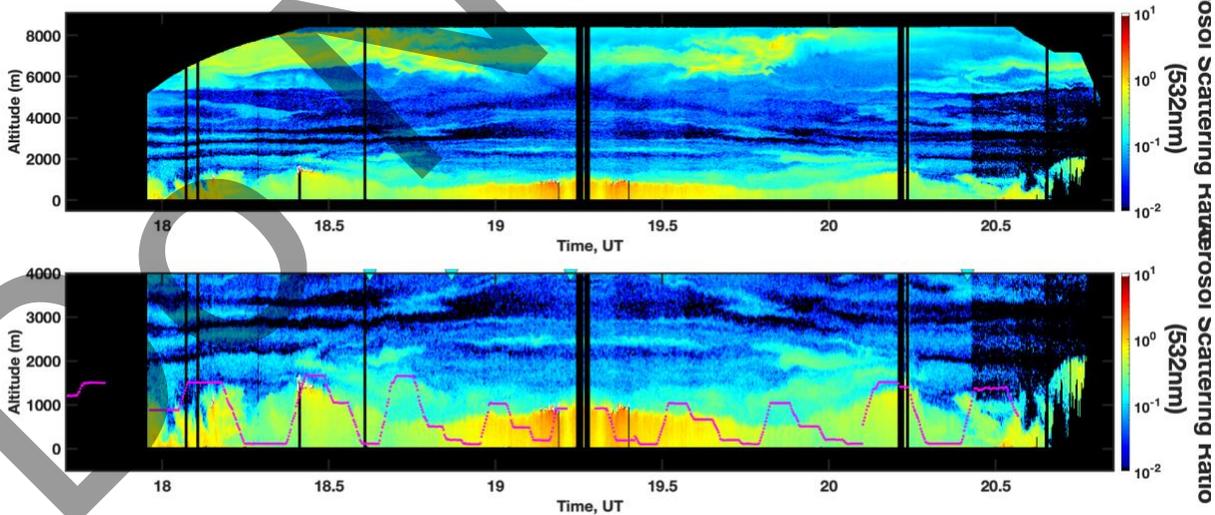
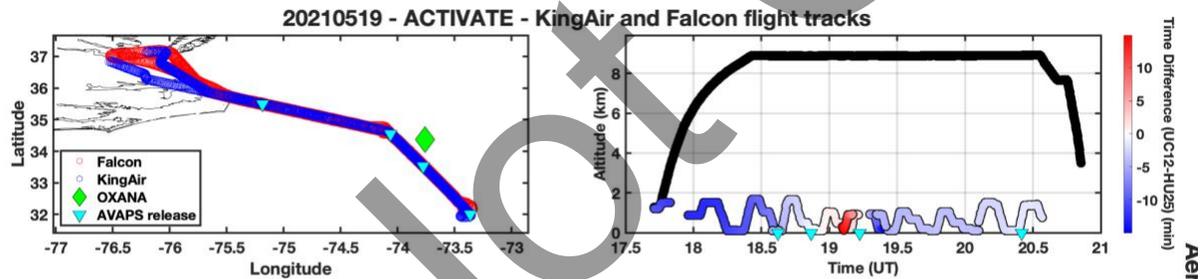
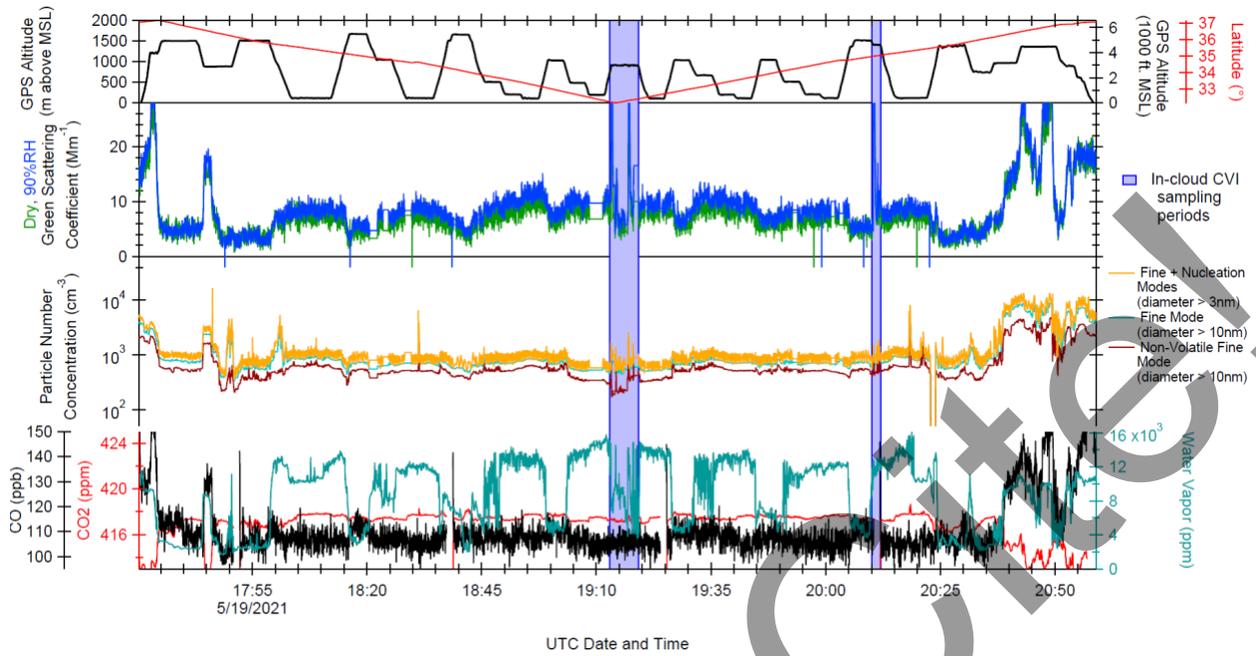
20:18:45 - Hit ship plume

20:22:52 - CPC & SMPS zero

20:23:52 - Back on sample inlet

20:51:00 Sample filter A off; WCM & humidifier off for landing

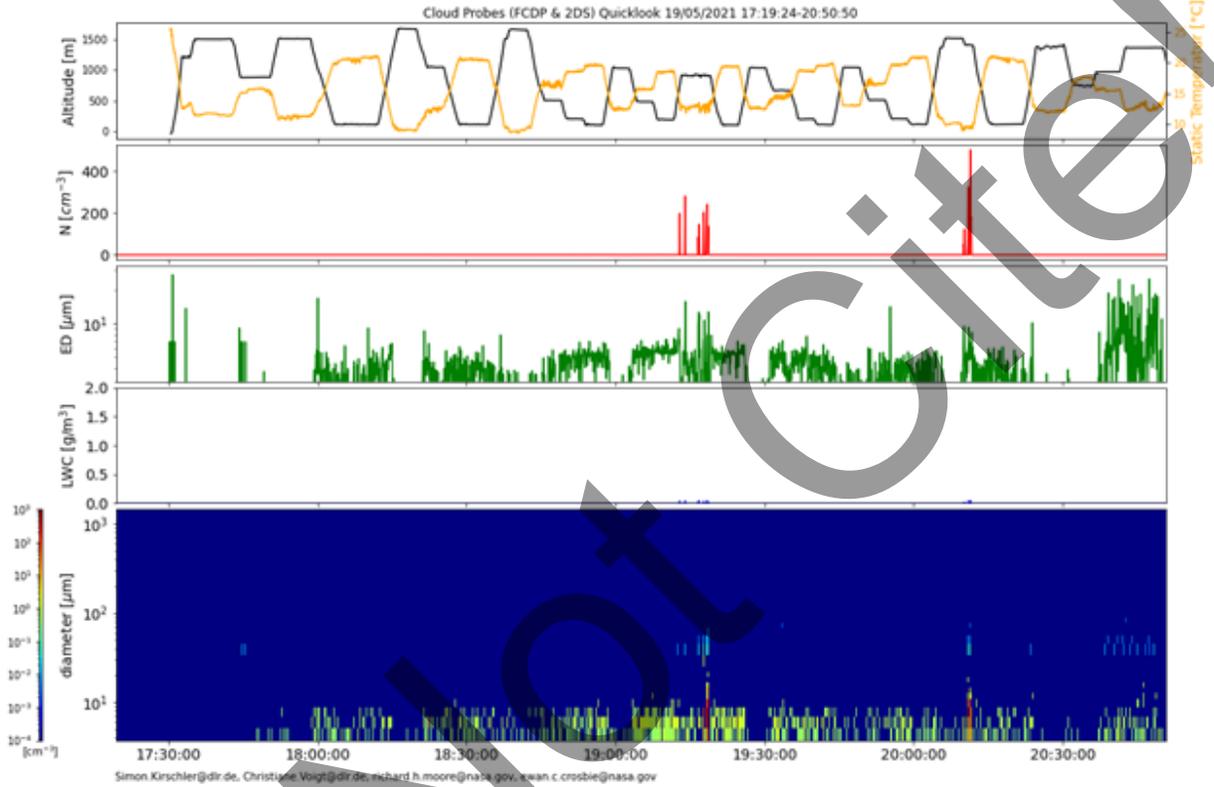




# Quicklook ACTIVATE Cloud Probes (FCDP & 2DS) Quicklook

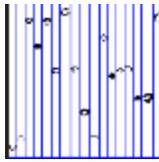
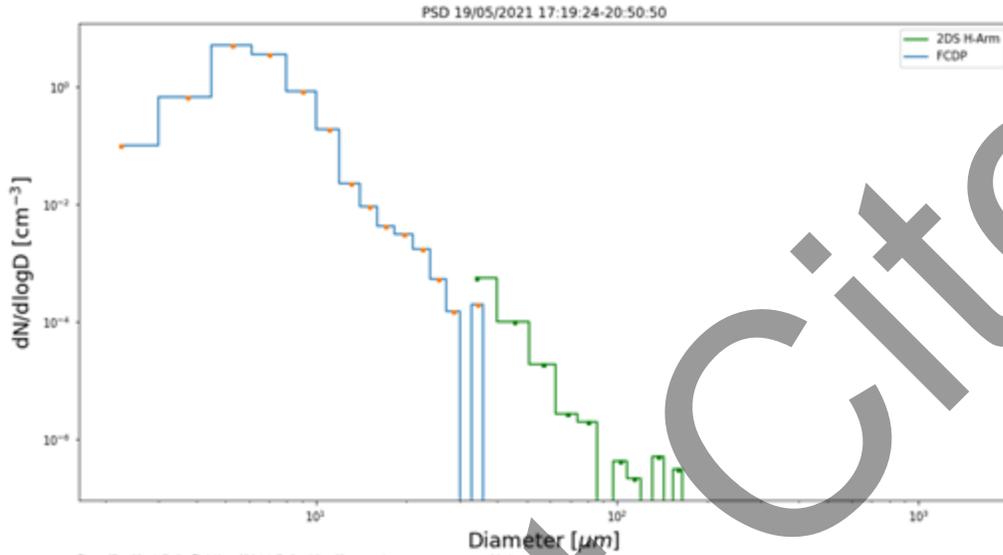
preliminary data, only for quicklook use

Simon Kirschler, Christiane Voigt, Richard Moore, Ewan Crosbie



# PSD ACTIVATE

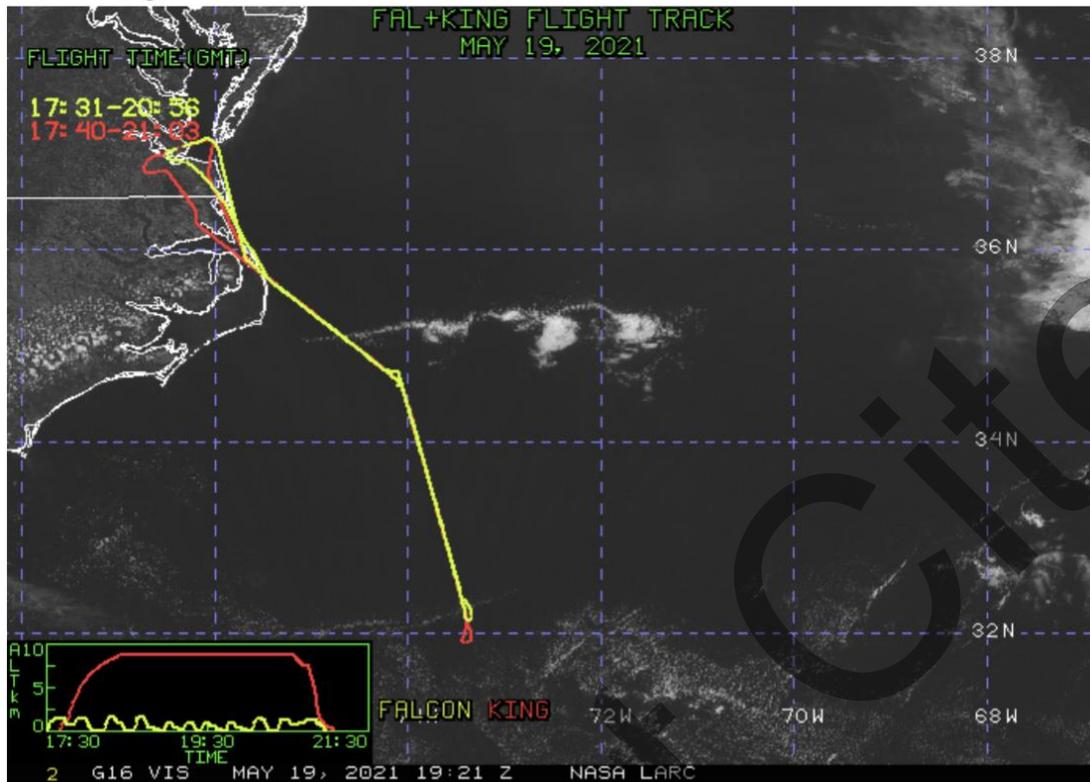
preliminary data, only for quicklook use  
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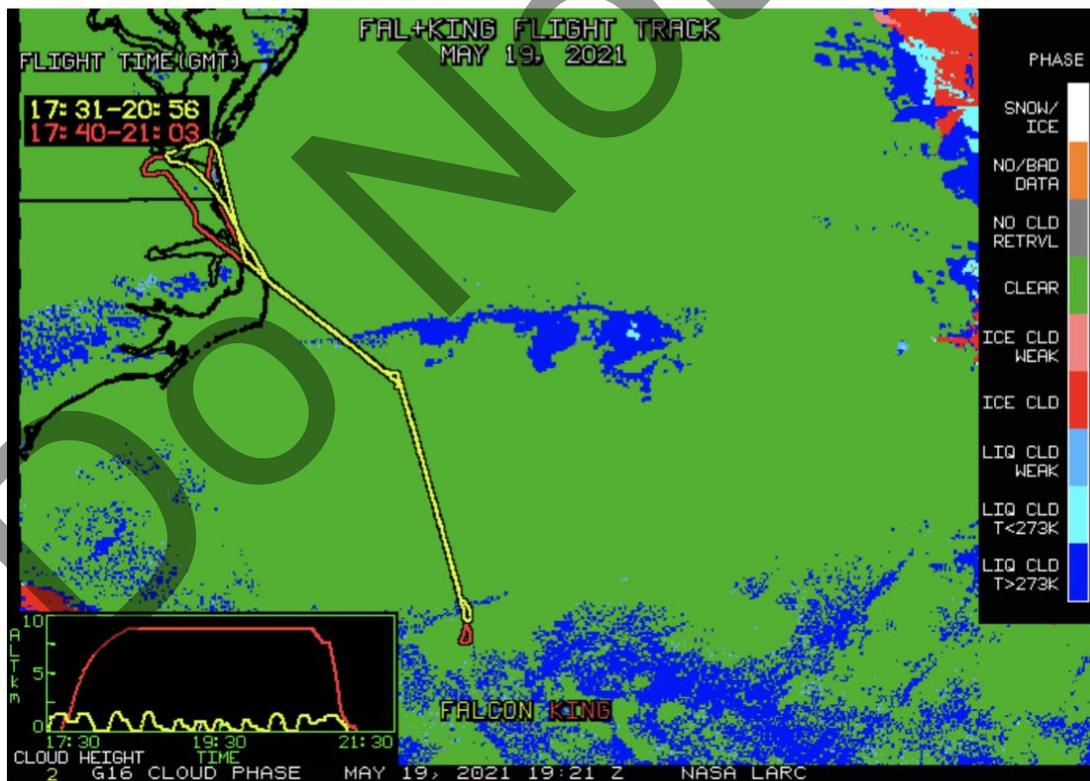
Few clouds without large droplets

NASA-LaRC Clouds Group GOES-16 Quicklook Images for Flight 68, 19:21 UTC May 19, 2021

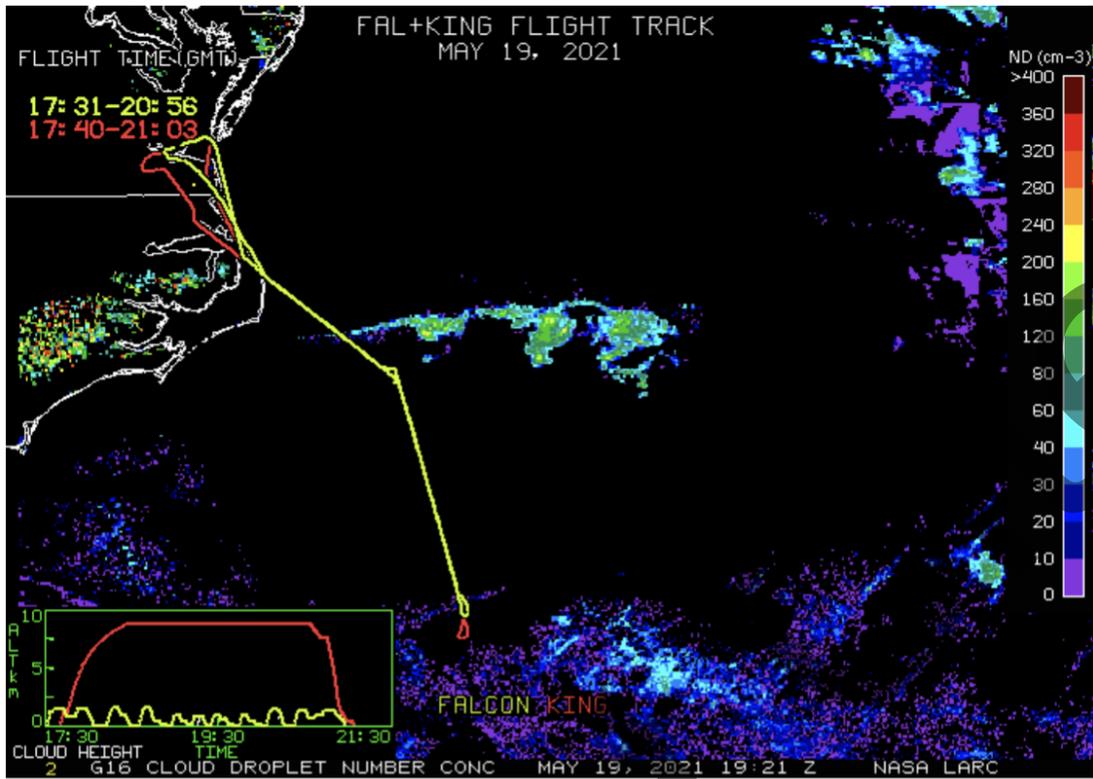
Visible Image



Cloud Phase



### Cloud Droplet Number Concentration (cm-3)



### Cloud-Top Height (Kft-ASL)

